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INFORMATION ABOUT THE HIRD PATENT PLANT

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SMITHSONIAN DEPOSIT

The plant consists of three or more stills, a pitch cooler, three or more heaters, condensers and Receiving Tanks.

STILLS

The first three stills contain a number of steel tubes, which form the only medium by which the heat is transmitted to the tar, which is made to flow along the outside surface of the tubes by means of baffle plates.

The tubes may be heated direct by means of burners, if a supply of coal gas or producer gas is available, or by a coke breeze furnace, or oil fuel.

The last still of the series is usually heated by the hot waste gases from Nos. 1, 2 and 3 which are passed through a flue beneath it and thence to the chimney.

PITCH COOLER

The Cooler is the same size as a still and also acts as a heat interchanger, being fitted with tubes through which the tar is passed. The finished pitch overflows from the Cooler without fumes, and is run direct to the pitch beds, or barreled.

HEATERS

The products of distillation, leaving the Stills, are passed through cast-iron coils in the heaters, which consist of cast-iron casings, and through which the crude tar is passed successively before going to the Pitch Cooler.

The heat from the vapors in the coils drives off the ammoniacal liquor and naphtha which are collected from the tops of the Heaters and passed through a separate condensing coil.

CONDENSERS

The vapors from the Stills are finally cooled in the Condensers, from which the oil passes through sight overflow boxes to the receiving tanks.

CONTROL

From the above it will be seen that the Plant produces simultaneously, besides the ammoniacal liquor, five fractions of distillates, the character of which may be varied at will by the alteration of the temperature of the Stills, each Still having its own heater, condenser and sight overflow.

TAR DEHYDRATION

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HEAT ECONOMY

The prepared Tar, on leaving the Still, has a temperature of about 260 degrees C., and means are taken to conserve this heat. The raw Tar, after leaving the Condenser and before entering the plant, flows through a heat interchanger, and thereby it is heated up to about 100 degrees C., and the outgoing Tar is cooled sufficiently to be loaded direct into casks or receiving tanks.

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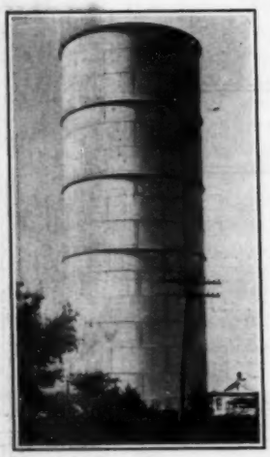

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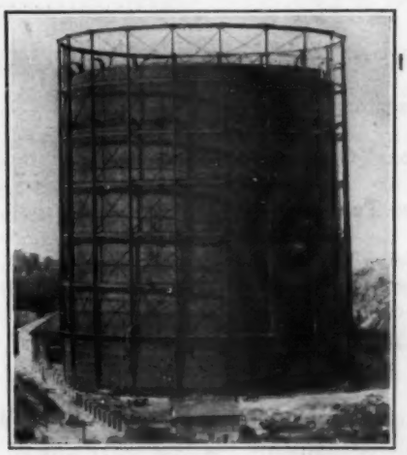

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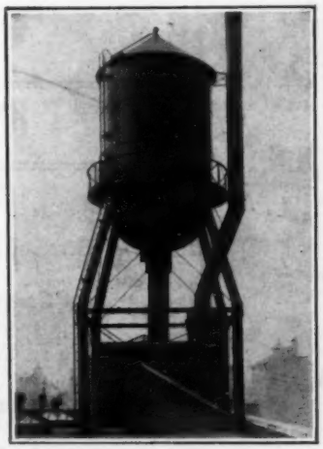

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American Gas Journal

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Study of Distribution of Combustion Gases*

A Remarkable Method Showing Diffusion of Gases

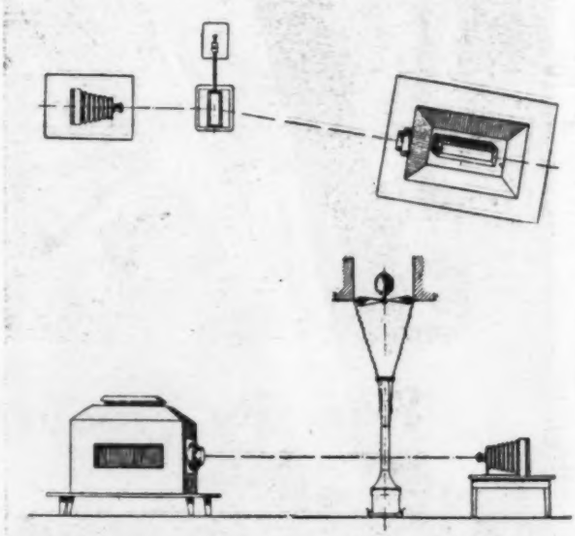
A method of studying the diffusion of heat in various apparatus, wherein it is generated and made use of, is found in a book, recently published by Julius Springer, in Berlin. The author describes an arrangement for carrying out the tests and indicates the results thereof in a series of photographs of pipes and tubes, which are traversed by the gas. The eye is attracted immediately by the strange diagrams which represent what is going on within the heating devices during the course of heat interchange. It is, of course, true that the technical literature contains descriptions of methods and photographs obtained thereby, which indicate the flow of liquids and gases, and which have been made especially for the purpose of studying the wave effects at the outlets of pipes by making use of the properties of polarized light. The science of aerodynamics utilizes threads or bands of smoke, which are distributed in an air current in parallel streams and which are then allowed to come into contact with the model of an airplane or the profile of a wing of a plane.

But in this case, in the method which is being discussed, a new technique is indicated. The characteristically colored bands of these heat phenomena are produced by an apparatus which is a model of the industrial appliance. We are concerned in this case with a visible chemical process, hence with a process which also produces results which are both measurable and weighable. This process allows the study to be carried out in a manner which is much less costly than those in general use, and which also requires a technique which is extraordinarily simpler than what must be acquired to attain correct results from any of the other methods known heretofore. This method permits the study of the laws which govern the phenomena, prevalent in the transmission of heat, in the circulation of liquids, etc. In fine, this method is able to co-ordinate in a remarkable manner the science of chemistry with that of physics and practical technology and the construction of heating apparatus.

Visible Diffusion Apparatus

The apparatus consists of a vertical box of rectangular cross-section, which is provided with a central portion made out of glass, through which the observations are made. The apparatus is seen in figure 1. The top of the box is provided with a fan, which is used for the purpose of creating a draft of air, traversing the box from the bottom upwards. A partition, which is furnished with a calibrated opening, is interposed between the fan and the central portion of the box. The air passes through this opening and the pipe connected thereto. By measuring the difference in pressure between the two opposite ends of the pipe it is possible to determine the speed of the air through the box and in this way the rate of flow of the same.

In the lower portion of the box there are suspended a number of strips of blotting paper which dip into



a container holding a solution of ammonia. The air in passing through the apparatus from bottom to top comes into contact with these strips of blotting paper, which are saturated with ammonia; consequently it becomes charged with a greater or less amount of ammonia vapors. It is possible to adjust the amount of ammonia vapor absorbed by the air.

The purpose of the apparatus is to study the laws of diffusion in the neighborhood of the surface of variously shaped bodies. Models of these bodies were accordingly made, more or less reduced in size, from a material of a porous nature, which is capable of retaining a small quantity of a chemical reagent. For this purpose thick porous filter paper was used. Out of this paper models of nozzles, banks of pipes, arranged in straight lines or staggered, boilers, etc., were made. The reagent that was used in the test varied in accordance with whether it was desired merely to observe or to measure the effects of the diffusion.

*From the work entitled "High-Pressure Boilers," by H. Thoma, Berlin, 1921.

Observation of the Effects of Diffusion

The porous models are soaked in a solution of hydrochloric acid. The ammonia vapors which come into contact with this acid forms clouds of sal ammoniac; that is, ammonium chloride. The phenomena which are connected with the diffusion of gases, eddy currents, the trajectories of fine streams of gas, etc., can all be observed by the use of this apparatus.

The figures that are shown, accompanying this article (figures 2, 3, 4 and 5) are photographs taken at a speed of 1/250 second. They are very remarkable pictures and enhance the value of the article to a considerable extent.

It will be noted that the bright threads of gas can be considered (in the case of a gas which is supposed to be hot while the tubes are cold) as representing those ports of the gas which have undergone a diminution in temperature, while the dark threads of gas represent the parts of the gas which have not yet been cooled down, not having been in contact with the walls of the heat exchanger—that is, with the tubes. These photographs serve to confirm certain theories that have been in vogue regarding the existence and the importance of a definite layer of gas around the tubes and other parts of heat exchangers, condensers, furnaces, gas generators, etc.

Measurement of the Effects of Diffusion

In this case the porous models were soaked in a concentrated solution of phosphoric acid, having a density of 1.7. A special arrangement of apparatus enables the determination of the following quantitative factors:

1. The quantity of ammonia entrained by the air entering the apparatus. This is determined by weight.
2. The quantity of ammonia that is held by the porous model. This is determined by titration with methyl orange.

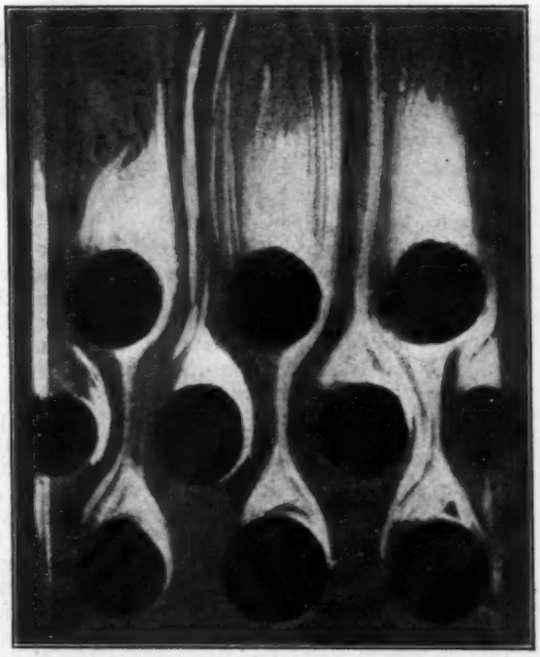
The purpose of determining these factors is to find

the ratio E. This is the quantity of the ammonia held by the porous model divided by that which has passed through it. E is accordingly the absolute yield of the apparatus.

By means of E it is then possible to calculate what would have been the co-efficient of the transmission of heat calories in a gas whose conductivity is known. The product would then be equal to the constant of diffusion x of this gas.

The rest of the article, from which this description is taken, deals with certain criticisms of the mathematical formulae that were derived at by Thoma and which are used to determine the conditions of diffusion that exist in commercial apparatus in which heat interchange takes place. There is given as well a detailed description of the exact nature of the diffusion phenomena and of its connection with the laws of hydraulics and thermodynamics. This matter is highly scientific and need not be gone into at this point. While the mathematics may not be exactly correct, and for this reason also we are not going into it any further at this point, the novelty of the method of determining the ratio E and the accuracy with which this can be done for almost any part of the apparatus makes the Thoma experiments of very great importance.

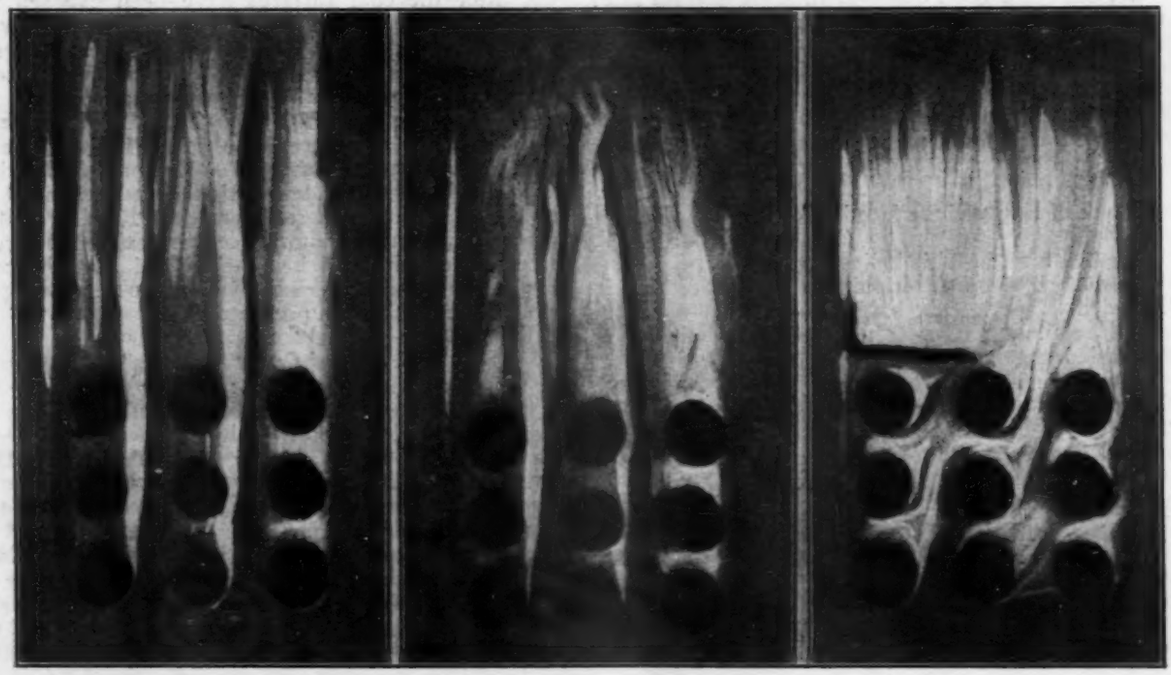
The analogy is drawn between what happens when air impregnated with ammonia vapors passes over and around the models of tubes and heating surfaces as they are found in the various industrial apparatus in which heat interchange takes place, and what occurs in this apparatus in actual operation. There is a direct relation between the amount of phosphoric acid absorbed from the soaked blotting paper models by the ammonia-laden air and the amount of heat that is absorbed from the hot gases surrounding a bank of tubes in an industrial furnace. The diffusion of the gases in the experimental apparatus is similar to that in the heating appartus. The ratio of absorption of phosphoric acid, which can be determined quantitatively, may be applied to the absorption of heat calories. The great value of the method lies in the fact that this ratio can be determined for each part of the apparatus independently. That is, the tubular models can be divided up into sections and the amount of phosphoric acid left behind in each section can be determined by titration. This will then give an indication of the distribution of the diffusion of the gases throughout the apparatus. It will



show, when translated into thermal language, what part of the heating apparatus is most efficient in effecting the transmission of the heat in the gases through the walls of the tubes into the liquid to be heated which is contained therein.

Separating Tar from Gas

The gas, after it is produced, is led directly, without prior cooling, into the tar separator. The tar is thus obtained in the fluid condition. For further details see Swiss Patent No. 90,254.



Spontaneous Combustion Slight Menace in Coal Storage

Bureau of Mines Tells Results of Study

Washington, D. C.—Although coal may be a bit difficult to obtain and store at the present moment, the Bureau of Mines evidently is of the opinion that some day the black diamonds will again be tumbling merrily into hopper and bin, from a statement just made by O. P. Hood, chief mechanical engineer, on the storage of coal and the attendant problem of spontaneous heating. In storing coal, the risk per ton of spontaneous combustion is really very small, says Mr. Hood. If one counted the times a portion of coal was stored where it would be undisturbed for a few weeks, the number of such storage operations in any one year would mount into the millions. Of these, a relatively small number show the phenomenon of spontaneous combustion. It is extremely rare that in the smaller operations involving only a few tons there is any heating. There is no spontaneous combustion of anthracite, and very rarely does the domestic consumer of bituminous coal find troublesome heating. The main interest in the subject lies in the large piles needed as reserves for public-service utilities and the industries.

Everyone desires to have directions for storage that are perfectly simple and yet will insure against loss. Unfortunately, the problem is too complicated for a simple solution. Many of the factors involved are difficult to determine, as there are no practical means of quantitative measurement. The factors involve chemistry, physics and engineering, and the man who is in close contact with the problem of stored coal is not always a good observer in these several lines. The result is many incorrect theories, opinions and prejudices. Much has been written on the subject, and the Bureau of Mines has published the results of extensive investigations, but the diversity of widely held opinions show that there is need of pointing out what are the factors that demonstrably are most concerned in the spontaneous heating of coal.

Acre of Exposed Surface in Ton of Fine Coal

The heating of coal is believed to be a surface phenomenon. If a ton of bituminous coal should be delivered in a single cube each dimension of the cube would be about 2.8 ft. When coal heats it is due to something that goes on with respect to the surface and not something that happens inside of the piece. So far as is known, this is true no matter how finely the piece is divided. It is therefore interesting to know the area of the total exposed surface in a ton of coal. If the cube, having originally an area of about forty-seven square feet, be continuously subdivided until all the pieces are fine enough just to pass through a sixteen-mesh screen the area of exposed surface in one ton of coal becomes an acre. It is perfectly obvious from this why it is that trouble from spontaneous combustion originates in fine coal, because the great increase in extent of surface does not begin until one gets below 1¼-inch, or nut size. If fine coal is kept out of the pile the heating surface is relatively so small as to remove the cause of spontaneous combustion. This remark applies not to the fact that one may buy lump coal but to the size of what actually gets into the storage pile. Coal bought as lump at the mine and handled with modern disregard for breakage may be far from lump coal when in the pile.

A unit of area of this coal surface generates a certain amount of heat, provided the coal can find the combining material, that is, oxygen. The amount of heat generated depends upon the temperature of a piece of coal. That is to say, coal put into storage at a temperature of 80 deg. Fahr. will generate very much more heat per unit of surface than if put into storage at the temperature of 60 deg. Fahr. It has already been a matter of observation that coal stored during the hot months of summer and in heated regions is much more liable to spontaneous combustion than coal stored in colder climes and in cooler seasons of the year.

Another most important factor is the freshness of the broken coal surface. For the first few days or weeks the freshly broken coal surface is very much more active in the taking up of oxygen and consequent production of heat than after a few weeks or months—a fact that must be borne in mind when considering the wisdom of crushing coal immediately before storing it. Spontaneous fires rarely occur after the coal surfaces have been exposed for three months. As the rate of heating increases with the temperature, it is evident that if the heat generated is not removed, the process becomes a self-aggravating one, and the rate of heat generation, instead of falling, may rise with time. If the temperature of the pile reaches 140 deg. or 150 deg. Fahr. and continues to rise, there is a high probability that within a few weeks a destructive temperature will be reached. If the temperature reaches 160 deg. or 180 deg. Fahr., there is almost a certainty that a destructive temperature will be reached and that the coal must be moved. Immediately the question of getting rid of the heat is presented.

A Pile of Coal "Breathes"

A coal pile is cooled by radiation and by the movement of air through it. Air moves rather freely through a pile of coal, and in many piles of coal this natural change, or breathing, of air is enough to carry away the heat generated. Some observers have stated that, in general, fires in large coal piles are found in the region from five to eight feet below the surface on the flanks of the pile. The rise in temperature of a coal pile is thus intimately connected with a very complicated ventilating problem, and there are no means of observing or measuring these small and

wayward ventilating currents. Since there are no means of knowing just what the ventilation is in any given portion of a pile, there is great hesitancy in advocating ventilating schemes for coal piles, as one is as likely to make trouble as to prevent it, unless extreme and uniform ventilation is assured.

There are many more factors of minor importance, continues Mr. Hood. One of the troubles has been that undue attention has often been given to the minor factors, such as the sulphur or the volatile-matter content of the coal, height of pile, etc., while the main factors, such as initial temperature, breakage in handling, freshness of the coal, and the screening before storage, have been overlooked or minimized.

Various factors in the spontaneous combustion of coal are discussed by Mr. Hood in Technical Paper 311, issued by the Bureau of Mines.

Coke Investigations at Birmingham

Investigations now being conducted by the Bureau of Mines at the Southern experiment station, Birmingham-Tuscaloosa, Ala., cover the physical properties of blast furnace coke, including physical tests, solubility of coke in carbon dioxide, and analyses of blast furnace hearth gas. In the study of the reactivity of coke with carbon dioxide, the effect of mesh of coke, temperature, rate of flow of carbon dioxide, and dilution with nitrogen has been further investigated. The work on hearth gas analyses at the plants of the Republic Company and the Tennessee Coal, Iron & Railroad Company has been completed. Completion of work at the plant of the Alabama Company at Gadsden, Ala., makes a total of six furnaces investigated in the Southern district.

Stock Selling to Consumers Successful

Southern Counties Gas Company of California Puts Over Big Issue

A little more than one year ago there met in one of the large office buildings of Los Angeles a group of gasmen representing the Southern Counties Gas Company of California. This public service corporation is one of the larger natural gas distributing companies in California. The object of the meeting was to determine the sentiment of the district superintendents on a plan of offering to the public an issue of preferred stock.

Questions were asked each of the superintendents who have charge of districts on the company's system. The first seven men questioned on the advisability of the company's plan to issue its preferred stock were of the belief that the issue could be disposed of in short order. And then the gas company officials turned to the last man present, Frank H. Bivens, district superintendent of the company's properties in Santa Barbara and Ventura County, one of the oldest employees in point of service and a man who can be relied upon to put over anything asked of him.

Bivens was the only man among the district managers who did not wax enthusiastic over the proposed stock-selling campaign. He declared that his territory in Santa Barbara was not an industrial center and, while there were wealthy Eastern residents there a portion of the year, he did not feel that they could be interested in the securities of a southern California utility.

The Southern Counties Gas Company at the above meeting decided to issue $1,250,000 of its 8 per cent cumulative preferred stock, this stock to be sold to its consumers in the forty-six cities in which the company operates. Plans were mapped out, circulars mailed to all consumers, display advertisements were placed in the newspapers of southern California and the campaign opened. Each of the eight districts whose superintendents had attended the above meeting were pitted against the others and all company employees were authorized to sell the stock.

Bivens went back to his office at Santa Barbara, took an inventory of his territory, organized his employees into teams and started work. During the first two weeks he failed to sell a single share of stock, although, as he said, he "talked himself black in the face." But he kept at it, and talked his company's stock on every occasion.

In addition to being an all around gasman, both artificial and natural, Bivens is a business man of no mean proportions. While his affairs in connection with the gas company keep him busy most of the time, he invariably finds time to give a part of his effort to the local chamber of commerce, the Santa Barbara Rotary Club, the Elks' Club and other organizations. And so Bivens at the end of the first month, because he talked stock to business men in his office, at the business men's noonday luncheons, and talked it among his club friends at night, had jumped his district into the leading place on the company's system.

Campaign Under Way

The second month showed better results and Bivens' district gained a substantial lead over all rival districts. At the end of October his territory had sold a third of the quota while one district had just passed the 11 per cent mark. Two months later his district had passed the 55 per cent mark with the nearest competitor, Santa Monica Bay, 18 points behind. The sales to Jan. 31, 1922, still placed the Santa Barbara-Ventura County district ahead with 74 per cent sold, Monrovia second with 47 per cent, Orange County third with 54 per cent and Santa Monica a close fourth place with 43 per cent sold.

During the month of April Bivens put his district

Frank H. Bivens

District superintendent of the Southern Counties Gas Company of California at Santa Barbara, who proved himself the star salesman of a rapid-fire stock-selling campaign. He is one of the "old guard" gasmen of southern California.

over the top and on April 30 the standing of the districts was as follows:

Santa Barbara-Ventura County.....	104%
Monrovia district	71
Santa Monica Bay	56
Orange County	54
Pomona Valley	47
Long Beach-San Pedro	44
Whittier district	31

While the campaign to-day as far as the Santa Barbara district is concerned is practically ended, Bivens' organization has continued to sell stock, and up to June 30 had sold 120 per cent of his quota. The other districts as of June 30 were nearing their quotas with Santa Monica at the 93 per cent mark, Monrovia a close third with 88 per cent, Pomona 67 per cent, Orange County 65 per cent, Long Beach 61, and Whittier 39 per cent.

Practically all of the issue of $1,250,000 preferred stock has been sold and since the stock increases from $99 per share to $100 per share on Aug. 1, it is believed that all of it will have been disposed of by the end of September.

Bivens proved the "dark horse" of the campaign and, although he took the lead at the outset and held it every month down to the present, it was not figured that he would do so. He did it as he does all things, however, by going into the campaign wholeheartedly. He instilled into every one of his employees the value of selling the stock to the company's consumers, and his enthusiasm extended to every one of his force down to the office boy.

Hard work has been the secret of Santa Barbara's success in this campaign. Night work, day work, stock-selling at all times have been the features of this stock drive. There are probably few people in Santa Barbara to-day who do not know of the Southern Counties issue of preferred stock.

Bivens was instrumental in drawing the 1922 Pacific Coast Gas Association convention to Santa Barbara next September. When that organization assembles in regular session late this summer Bivens will be the busiest man in town and the association is looking to him to help stage one of the finest of the convention programs there.

In the Colorado Coal Field

The coal mines of northern Colorado are being operated under State militia supervision. The operators are said to be contemplating a big raise in the price of coal. Governor Shoup says:

"The coal operators, as well as all other classes of producers of the necessities of life, must play fair with the people of this State. Information, which I consider reliable, has come that some operators have advanced the wholesale price of coal in northern Colorado fields. These fields are now under the protection of the military forces, in order that those desiring work may do so in safety and that the property shall be protected. Wages to miners have not been increased so far as I have any information. With the nation threatened with a fuel shortage as it is, particularly at this time, and with a reduction of freight rates and no increase in wages, it is clearly evident that an advance in the price of fuel at this time is wholly unfair to the public. Taxpayers of Colorado are meeting expenses of the military forces in the mining districts and making it possible to provide work for our Colorado miners and it would appear to be the height of ingratitude for operators working their mines under that protection to take advantage of the situation by increasing the coal prices.

"If such advances have been made and former prices not re-established and continued the military forces will be withdrawn from the camp of the offending operator. Colorado will not be a party to anything that even smacks of profiteering or taking advantage of the people of this State in any such manner. The coal operators, as well as all other classes of producers of the necessities of life, must play fair with the people of this State.

"As Governor, I have totalized a part of the national guard and authorized the enlistment of conditional State rangers, not for the protection of anyone's pocketbook, but to protect the mines and miners who wanted to work; all of which was done only in the interest of the public at large."

Every law-abiding citizen—and that is the only kind wanted—will honor Governor Shoup for his laudable stand.

State Teaches Natural Gas Engineering

Louisiana Starts Campaign of Education of Operators

By O. FOERSTER SCHULLY

In an effort to explain the engineering needs of gas and oil fields, Ben K. Stroud, supervisor of the minerals division of the Louisiana Department of Conservation, has published a series of five articles in a Louisiana paper discussing the possibilities of the north Louisiana and south Arkansas gas and oil fields from the engineer's point of view and making certain recommendations for the maximum scientific development of those resources. Each article presents a different angle on the engineering problem, as seen by a minerals expert, and the series as a whole is an illuminating contribution to scientific gas and oil literature. For those readers of the JOURNAL who are interested in field activities of the natural gas operator, we are printing a resume of the series to present its most salient facts.

The first article discusses the future of the fields and the desirability, to say nothing of the importance, of technical advice for the operator. It points out that the State of Arkansas has only recently entered the ranks of the important oil and gas producing States, explaining that the favorable results of development in and around El Dorado have opened the eyes of the gas and oil world to the future possibilities of the section.

"The proper development and conservation of these great deposits," Mr. Stroud writes, "should be the chief concern of the State and operator alike. Without this co-operation and the practical use of oil-field engineering much of the oil and gas will be either wasted or else never be recovered."

Continuing along these lines he announces that this is an industry within itself and that better drilling and production methods should be employed in the future to correct some of the mistakes of the past.

"Like any other business, the operator who makes the best possible use of the best methods will win over the operator who develops his property after a hit and miss fashion. The State line between Arkansas and Louisiana may mark the boundry of State government and regulation, but no State line exists in so far as the oil and gas deposits are concerned, in the great area. They were formed by nature during common geological epochs and may therefore be considered in many respects as a single unit.

"The unconsolidated formations which overlie the productive beds in north Louisiana and south Arkansas differ greatly from the limestone shales and sands found in other States—in the same relative positions and for this reason we find much more complicated water conditions, pay conditions, etc."

In Press Notice 12,913, U. S. Geological Survey, the article adds, Heald and Rubey have called many important points to the attention of the operators. The report in question states that a great number of test wells have been drilled in southern Arkansas without striking oil or gas in great quantities except in the El Dorado district, showing either that the pools in this region do not bear the same anticlinal structure that they commonly bear in the mid-continent oil fields, or that geologists have not learned how to locate the anticlines in this field by studying the surface formations.

If the geologist is without definite rules to guide him in discovering pools, the press notice suggests, his usefulness is much less than it otherwise would be, and the operator must hunt for new pools blindly, so that his chances will be reduced and the average outlay for each new pool he may find will be greatly increased.

Hit or Miss Drilling

Mr. Stroud concludes this article by remarking that random drilling has discovered many great fields and persistent prospecting without geologic guidance would ultimately find every pool—"just as a blindfolded man could find almost every object he sought if he sought long enough, but this is no reason why the blindfold should not be removed if it can be removed."

The second article deals with careless drilling and lack of thorough knowledge which is responsible for the loss of many wells in north Louisiana and south Arkansas. It states that one of the most effective aids in locating undiscovered pools is an accurate, thorough knowledge of the conditions in fields that have been developed and anyone who hopes to find new fields in southern Arkansas should study the El Dorado and the fields to the south of Louisiana.

"In our Louisiana experience," Mr. Stroud writes, "we have found that careless drilling has been responsible for many failures. For instance, in the Haynesville field, the John Doe Oil Company, we will say, finds, by careful prospecting, the top of the Blossom sand at 2,750 ft. and that there are eighteen feet of actual pay. This would make total depth of the well 2,768 ft. The John Doe Company then sets a back-pressure valve to prevent the well drilling itself deeper, and brings in a good producer.

"Just across the line is the Black Oil Company. They do not take into consideration the relative elevation of the two wells, as to which is the higher or the lower, but drill blindly ahead until at a depth of, say, 2,760 ft., they decide they have found the top of the Blossom sand. They have not taken the trouble to core barrel and accurately locate the top of the pay, but have simply judged from their neighbor's well and from their own ditch cuttings that they have the top of the sand.

"As a matter of fact, they may be into the sand several feet—but they say, 'The John Doe Company had eighteen feet of sand, so we are safe in taking the same amount.' Result, a well drilled through the pay and into salt water. This happened not once, but many times in the early development of the Haynesville field. It seems to be only human for an

operator to want all the pay possible, even at the great risk of ruining his well."

In both the Homer and Haynesville fields, the article points out, many wells were found to have drilled themselves deeper where not controlled at the bottom by back-pressure or other similar devices. The State Conservation Department has records of wells at Homer which were found to be twelve to fourteen feet deeper than actual depth as measured at the time the wells were brought in. This was due to the operators, who are indifferent to the danger of salt water intrusion, not taking the simple precautions necessary to eliminate such conditions.

Mr. Stroud explains that the careless and inefficient drilling methods of one operator may hurt not only himself but the neighboring properties as well. The necessity for accurate logs is accentuated in locality as much as in north Louisiana and south Arkansas. The reasons for this are manifold, the most salient one being that the surface indications in this area are so obscured that it is practically impossible for the geologist to locate with any certainty the folds and faults that have been proved to exist by actual drilling.

"It is true," writes Mr. Stroud, "that a few of the fields have been located on geological advice without reference to logs but these are the exceptions rather than the rule. The greatest possible assistance that the geologist can get is from reliable well logs, particularly where cores have been taken at important points. Having these and accurate well elevations and locations, we may expect far better results from the geologist than we have had in the past. As a matter of fact, the future discovery of oil and gas deposits is going to depend largely upon this source of information."

In the third article, Mr. Stroud remarks that the lack of sympathy and co-operation between operators, drillers and engineers prevents thorough recovery of oil and gas. He leads up to this fact by discussing the various mishaps which interfere with the complete success of oil and gas operations.

"The question of salt water intrusion," he says, "is in itself a very large subject. It has been our observation that once a well is found to be making quantities of water, that the average operator simply gives up and makes no consistent attempt to correct the trouble. Many wells and, for that matter, whole areas, could be materially helped by a consistent program in lessening the quantities of water entering the wells."

No Reason for Top Water

He derides all excuses for allowing top water to continue, day after day, to enter a well and from there to be lifted to the surface. Casing and cement will effectively reduce water from this source. A bottom water job is not always hopeless—in fact, nearly all bottom water can be shut off if the well is taken in time. Wells which are drilled into salt water can be successfully plugged back if handled right. Edge water or water native to oil or gas formations cannot, of course, be excluded and, in fact, its encroachment often has a tendency to drive the oil or gas to the well, where it can be lifted to the surface. It is also true that oil or gas may be driven by water to isolated areas where their recovery is doubtful unless later tapped by accident.

Mr. Stroud proclaims the percentage of extraction from any field, another interesting subject. It is doubtful, he remarks, if over 15 or 30 per cent of the total oil content of a given area is recovered. The action of gas expelling the oil from the pay is an important economic feature. Gas is often wasted in the early life of oil wells at the expense of later production.

Not Sufficient Study Given

"These problems have not been given sufficient study by the operator, although they have a vital bearing upon his success or failure," the article continues. "The practical application of petroleum engineering is what the whole situation needs. We all recognize that the geologist and the petroleum engineer are too far apart from the driller and the practical operator. The mental barrier which exists between these two groups is utterly absurd and should be broken down. There will be no real progress until the engineer and the operator have learned to work in closer co-operation. In the writer's opinion the fault lies somewhat on both sides.

"The average operator is usually largely influenced by his drillers. The latter are, as a class, entirely out of sympathy with engineering ideas. The fact that nearly all drilling is done on the contract system does not tend to improve their understanding, although this is not necessarily true."

Lamenting the incomplete logs of oil and gas drilling, Mr. Stroud writes that no driller should be allowed to turn in a log showing formations penetrated under such terms as "rock" or "hard rock" or "soft streak." Such a lack of description renders the work of making an accurate correlation of logs almost impossible and the Department of Conservation depends largely upon the logs as the source of information. The records of the Louisiana Department of Conservation are full of such logs. They merely represent a hole in the ground—nothing more. Were all the logs accurate, he adds, the oil and gas industries in Louisiana would be further advanced than we find them to-day.

The fourth article of the series suggests that what the industry needs is engineers with practical drilling experience and favors technical training for drillers by means of lectures. Mr. Stroud credits the unfounded criticism of new systems and methods by operators to a deficiency of up-to-date knowledge. The rotary system of drilling, he writes, has been frequently criticised because of the inaccurate well data as well as the occasional passing up of productive oil or gas horizons. The rotary system cannot be charged with these deficiencies—rather the trouble lies with the men who are using the system. To bear out his statement, he quotes A. W. Ambrose, Bureau of Mines Bulletin No. 195:

Has Met Problem Single Handed

"In the past the operator has handled all problems pertaining to the recovery of oil single handed. He has been too busy to give them special attention and he has had little competent engineering advice. Oil, gas and water occur underground according to cer-

tain natural laws. Undoubtedly an engineer who is familiar with production practices and understands the fundamentals of the accumulation of oil and gas, can be of service to the producer by specializing on certain problems with a view to getting more oil from the sand.

"In every other enterprise of similar magnitude the engineer is regarded as a necessary unit to its operation and he should be so in the production of oil. His field of work should extend to every phase of production in which science and engineering and geology apply."

Stressing the necessity of trained engineers, Mr. Stroud remarks that they should be to the oil and gas industry what the mining engineer is to the metal mining industry. A mining engineer, he explains, is a man who, after having been graduated from a recognized school, goes into the mines and there, through actual practical experience, becomes thoroughly familiar with all branches and angles of the business. After three to five years of this sort of work, he can probably be called a mining engineer. The name should also hold true to the petroleum engineer. The young engineers of the industry, he contends, should go into the fields and stay there until they are capable of holding down any job on the leases and who learn to apply their theoretical knowledge to practical conditions. There are too few of these men and as the tendency has been for engineers to dodge this sort of training the industry is not getting the full advantage of their training.

The driller, also, according to Mr. Stroud, should be educated along lines of practical engineering. He proposes to give them lectures on elemental geology, the necessity or accurate logs, practical drilling under the heads of mud-laden fluids, cementing, core barreling, testing formations, controlling oil or gas wells, the proper use and care of machinery, proper firing of boilers and the efficient production of oil and gas. Such a series of lectures could be given in three days, and each lecture, of course, would have prepared charts, blue prints, etc., to fully illustrate every important point, as well as to call attention to excellent reference books already in print.

"It is true," he adds, "that many drillers and even operators have no apparent desire for such information but there is no doubt that, under proper conditions, they could be shown the necessity for a better understanding of the fundamental requirements of the industry. . . . A certain company with headquarters in Oklahoma has been following the practice for some time of sending their drillers to other States for the purpose of studying drilling practice, etc. They state they are more than satisfied with the favorable results obtained in thus educating their men. This is another logical way of broadening the drillers' education."

Counsels Conservation

In the fifth and last article Mr. Strouds reasons for wise conservation, not hoarding, with parallel laws affecting fields in other States. Thorough geologic and topographical surveys, he writes, is the best means of prolonging the life of fields.

"It is the duty of all States in which gas and oil are produced," he remarks, "to see not only that the highest conservation possible is practised but to aid the operator in every way possible in his work. There is a great necessity at the present time in Louisiana for an accurate topographic mapping of the entire State, together with a network of bench marks throughout the oil country. In north Louisiana we have four or five different sets of elevations and as a result the elevations of the wells are always more or less in question.

"We are also badly in need of a thorough geological survey, as it will not doubt have a tendency to reveal many resources of which we are at present uninformed. The State of Arkansas could likewise well profit by these surveys. It is unfortunate that our governments, both State and National, often neglect these important matters until a great part of the development work is done.

"Another important side of the State's duty is in the work of conservation of natural resources. By the term 'conservation' is not meant hoarding, neither does it mean wasteful use. It means, rather, the wise utilization of all of nature's products for the benefit of the greatest number.

"It is evident that the State and the operator have parallel interests in this respect. The State, however, should and does go further than the interests of the individual operator. It aids the scientific and conservative element and protects it from the man who apparently, through ignorance or willfulness, has no desire to conserve. Any State conservation board, through its different activities, should and can be of great service in the future exploitation for oil and gas, not only in conservation but in the more efficient and scientific drilling and producing branches of the industry."

The laws governing conservation, he states, are too important to the welfare of any State to be carelessly enacted or enforced. Recommending analyzation of not only future regulations but present ones as well, Mr. Stroud proposes four questions to be applied to each law:

1. Does the proposed regulation or rule really tend to conserve?
2. Does it adequately protect the State?
3. Is it fair to all operators or is it discriminatory in practical application to one particular section or class?
4. Is it clear cut in intent and is it detailed enough to cover the ground specifically so that its provisions may not be misinterpreted?

"If a law," he concludes, "will not stand up under such analysis, it should be promptly discarded."

Combined Oil and Water Gas

The process which is described in British Patent No. 159,175, relates to a method of employing liquid hydrocarbon and solid carbonaceous matter in such a manner as to produce simultaneously and initially a combined coal gas and oil gas, or coal gas, oil gas and water gas. The essential points of the new invention are as follows: (1) The employment of a stable mobile fuel in which a high percentage of carbonaceous matter is suspended in oil to form the gas product; (2) the omission of the separate step of oil gas enrichment of the coal gas or water gas; (3) the disposition of the ash recovered from the combustion of the particles of solid in the composite fuel; (4) the use of liquid hydrocarbon instead of water in the wash box to collect tar and lampblack and make further fuel.

Developments in Gas Technology

Important Information Gathered from All Parts of the World

By ISMAR GINSBERG, B.Sc., Chem. Eng., Associate Editor

Recovery of Lower Hydrocarbons from Gas

A series of experiments has been carried out in the coal research laboratories at Muelheim, Germany, to determine the best conditions for recovering hydrocarbons of low molecular weight in the gaseous state from coal gas and coke oven gas. The results of these experiments were published in the German journal, *Kraft und Stoffe*, May 20, 1922. The gas mixture is passed through activated charcoal under heat and pressure. It is claimed that this treatment will increase the calorific power of the gas very considerably. It was found that a gas, having an original calorific power of 7,320 calories, acquires a heating power of 19,900 calories after this treatment. Furthermore, the produces that are recovered find extensive application in many fields of the chemical industry.

Low-Ash Coke

The Chemische Fabrik Griesheim-Elektron A. G. has obtained a patent on a process for making a low-ash coke from peat or lignite coal. The raw product must not contain too much pyrites or silica. It is first treated with muriatic or nitric acid, then given a good washing, dried and finally coked in the usual manner. (See German Patent No. 310,191.)

Portable Gas Heater

The apparatus in the accompanying figure shows a type of portable gas heater just put on the market in England. Its resemblance to the electrical devices used for the same purpose is apparent. It is claimed that the gas device compares most favorably with the electrical device in cost of heating. The apparatus has a very attractive appearance. The reflector is made of copper, which is highly polished within. The heating element consists of a specially designed mantle. There is no flue in the apparatus, and consequently all the heat developed is reflected straight out into the room, the heater giving 100 per cent efficiency. It consumes no more gas than a lighting burner and its products of combustion are similarly discharged. The apparatus is known by the trade name of "Garba" Portable Heater.

Gas in Coal

In the analysis of coal, trouble has always been encountered, due to the gas that is included in the coal. This question is discussed in a recent number of *Engineering*. The very first quantity that is determined in any analysis, viz., the moisture, and likewise the volatile constituents are affected by the changes that are brought about in the coal by the very method of analysis. The occluded gas can be determined by pumping off the gas liberated, or by collecting the gas given off in a vacuum, either at the ordinary temperature—15 deg. Cent. or lower—or at 100 deg. Cent. Particularly at ordinary temperatures, the experiments will last many days. There is evidence that the first liberation of the gas will be followed and accompanied by a readsorption, and that the establishment of an equilibrium condition will be a slow process depending, among other conditions, on the diffusion of gas from the inner layers up into the first evacuated surface layers of the coal.

Portable Gas Heater

Gas Hot Plate

The gas burner is telescopic, so that when a pan is placed in one of the openings in the hot plate, the burner is pushed down by the weight of the pan, while when the pan is removed and the opening closed the burner rises close up to the hot plate. For heating water there is a spiral tube arranged within the housing of the hot plate. (British Patent No. 178,242.)

Water Gas with the Aid of Electricity

In the German journal *Elektrische Anzieger*, volume 39, pages 199 to 202, there is described a process of making water gas by the aid of electricity. For this purpose the excess electric current from a power plant is used to provide the requisite heat for the process.

As the Journal Views It

"Babson's Reports" Attacks Gas Industry

"Gas companies have probably seen their best days. Certainly when a cheap method of heating by electricity is discovered, gas companies for the most part will go out of existence."

That is a statement contained in "Babson's Reports," issued July 11, 1922, and it has had wide circulation, as the Babson's letter, due to wide advertising, has built up a large following. We don't know the basis for the assertion, for to us it is the remark of a man who does not know what he is talking about. The organization which is in back of the letter is supposed to thoroughly investigate and furnish statistics on which investors frequently place their dependence. To the most unthinking it must be apparent that there has been no real investigation made of this field, and we are at a loss to account for the assertion.

Col. Oscar H. Fogg, secretary-manager of the American Gas Association, has already voiced the protest of the association against this statement, but Colonel Fogg's statement should be backed up by every gas company official. The reports are issued from Wellesley Hills, Mass.

Colonel Fogg in his letter to Mr. Babson points out the growth of the industry from 1901 up to 1920, and adds that indications are that the growth will continue, as gas is steadily replacing other fuels for a wide variety of uses.

But it is against the possibility of just such statements as head this editorial that we must protect ourselves. To a certain extent the blame lies with the gas industry for not having been more vigorous in seeking publicity for the various statistics covering our field. The American Gas Association is doing splendid work in this direction, as are the numerous State committees on public utility information, but all of this should be backed up by steady work on the part of each company no matter where located or how large or small. It is for the gas company executives to back up our national association right now by some vigorous work.

Where the Expense Lies

The statement made by R. H. Burdick in last week's issue of the JOURNAL, that 62.5 per cent of the total operating expenses of seventeen gas companies was incurred in the operation and maintenance of the manufacturing department, has aroused a very great deal of interest and comment. While it is clear that the expenses of this department must necessarily run higher than any other, at the same time gasmen generally agree with Mr. Burdick that the ratio is entirely too high and that the manufacturing department generally offers a field for work that should have for its object the obtaining of economies.

Perhaps the underlying reason for this difficulty is shown most clearly in the statement by Mr. Burdick:

"It is a curious commentary on the gas business, in the main, that in its most expensive branch of operation —that of gas production—is to be found an almost fanatic adherence to old-fashioned apparatus, equipment and methods. During the past fifty years certain improvements and refinements have been made in our gas plants which pertain chiefly to auxiliary operations; efficiencies in gas manufacture have been increased slightly, but no fundamental changes in the art have been put into general usage since Lowe brought out his scheme for making carbureted water gas.

"American inventive genius has not necessarily been lax nor failed to grasp the significance and opportunities for development of new economic systems of gas manufacture, but barriers of skepticism and indifference have too frequently been raised against it by ultra-conservative financial interests and hidebound utility operators. The result has been the diversion of much-needed talent and brain power, which might be of inestimable benefit to the gas industry, to fields where appreciation and remuneration are more commensurate with the efforts put forth.

"Consider for the moment the three standard systems employed in 'city gas' manufacture—i. e., coal gas, carbureted water gas and crude oil gas. A great variety of designs of apparatus for making these gases are in use, regardless of the fact that with such diversity there must be one in each class which is more efficient than the others."

It would be most interesting to obtain the views of others on this all-important subject, and the JOURNAL will willingly devote its columns to a discussion of the matter. There may be many who have found short cuts to economies, and if so we believe that it is vitally essential to the gas industry that they be made known so that perhaps the idea or the method may be adapted to use in other sections of the country than the one in which it is now being used. It is interesting to know, however, that gasmen generally are of the same opinion as Mr. Burdick.

Fuel Efficiency

What the Future Holds for Petroleum and Natural Gas

By DR. O. J. SIEPLEIN

Dr. O. J. Sieplein, in charge of the Bessemer Gas Engine Laboratory, has given out some interesting facts regarding the future use of fuels with special relation to the future of petroleum and natural gas, as follows:

Fuel of commercial importance includes wood, coal, charcoal, coke, tar, petroleum oils, the various gases.

All solid fuels contain ash which must be handled. In many heating operations the maximum temperature is needed at the end of the process. The working temperature is reached only after the fire has been burning for some time; that is, considerable fuel is used in these fore and after periods. These periods mean, of course, additional labor and wear on the equipment. The handling of the solid fuel entails a high labor cost.

The facts contained in this article form a valuable basis for preparing publicity matter for the newspapers. The publisher of a national magazine of large circulation recently told us that he had found a tremendous interest in this subject.—Editor.

Wood is the fuel which has been the longest used. It contains considerable water, which displaces combustible material and thus reduces the effective fuel of the charge. The large bulk and low heating value of wood, as well as the demand for it in other lines, make it of little importance as an industrial fuel. The most important industrial fuel is bituminous, or soft, coal. The production of soft coal in the United States is more than half a billion tons a year, with a value of considerably more than a billion dollars. Soft coal contains some water and much more ash than wood. The effective fuel varies from 80 to 95 per cent of the coal used. All users of coal know that a good fireman will use a minimum of coal and produce a maximum of heat with practically no smoke. Such a fireman is busy with his fires continuously and is a very rare individual. He can care for only a very few fires, and therefore the labor charge is high. This labor charge may be considerably reduced by mechanical stokers. The modern mechanical stoker is extremely efficient. It delivers the fuel into the fire-box at the most desirable point; it charges fuel continuously and more uniformly than the best hand firing does, with a maximum of control of heat, a minimum of smoke and waste, and at a low labor cost.

Wood and soft coal yield gases during the roasting they undergo in the fuel bed just after charging. These gases are burned as they are evolved; the flames of burning gas increase the fire zone and increase the heat losses. Because of the increased fire zone, the total space heated is greater and the temperature of the combustion is lowered. In order to confine the fire zone to the actual fuel bed, wood and coal are roasted to form charcoal and coke. These roasting processes drive off the volatile portions of the wood or coal and yield a residue which is almost pure carbon. Of course, the residue contains all the ash of the original and the percentage of ash is higher. Because of the lack of volatile portions a much higher intensity of firing can be attained with charcoal or coke than can be obtained with wood or coal. During the roasting process large quantities of other products are formed. In the old processes these are lost; in the modern processes the by-products are recovered. The value of these by-products is very large. The heating value of the combustible gas that is obtained is equivalent to that of nearly one-fourth of the coal used. We will refer to this in the later discussion of industrial gases.

Liquid fuels are very convenient to handle, as they may be piped to the fire-box. The burner sprays the fuel and needs very little attention. There is practically no ash. The fore and after periods of firing are reduced or eliminated. The fuel may be directed to the place most needed for just the time needed, and the combustion may be controlled to give any desired effect. These features make firing with oil or tar a very desirable process. The ease of control and desirability of such firing have led to two recent developments in the use of coal. These are powdered coal and "colloidal fuel." Powdered coal can be blown into the fire-box and directed to the desired spot nearly as well as oil. Ash is not eliminated and the mechanical handling of coal powder is accompanied with some fire risk. Colloidal fuel is a mixture of coal powder with tar or oil and some "fixing agent" which prevents the settling of the powder. This colloidal fuel can be handled like oil, and the user has practically none of the special fire hazard that the user of the powdered coal has. The process increases the total fuel value of the oil by that of the coal, and in this way acts as a lengthener for the supply of tar and oil.

Gaseous fuel has many of the advantages of liquid fuel: it is easy to control the combustion; ash is absent. For gases we may preheat the air supply and thus attain a higher temperature of combustion than is otherwise possible. This heating of the air supply is effected by

passing the incoming air through chambers or flues which are heated by the products of combustion. Gases made from coal and natural gas are the only commercially important gases for general use. The manufactured gases are water gas, producer gas, coke oven gas and coal gas.

Water gas is made by passing steam over hot coke or anthracite coal. The carbon combines with the oxygen of the steam, producing carbon monoxide. The product from these furnaces is therefore a mixture of hydrogen and carbon monoxide. Both of these burn with colorless flame; carbon monoxide is poisonous. The cost of manufacturing this gas is too large to make the product of industrial importance. Its heating value is about one-third of that of natural gas. It is usually mixed with coal gas in order to increase the supply of the latter.

Producer gas is made by roasting of coal in a cylindrical stack called a producer. This is equipped with steam jets which aid the air draft. The steam also enters into reaction with the fuel used. The main reaction is a roasting of the coal with a very limited supply of air. The product may be looked upon as a mixture of water gas, coal gas and a large amount of carbon monoxide. The carbon monoxide makes the material too dangerous for household use, even if its low heating value did not seriously interfere with such application. It has about one-sixth the heating value of natural gas. This leanness makes it impracticable to use this gas for firing except in some few special operations. Producer gas is a very good fuel for gas engines. It is well known that gas engines are more economical with respect to the efficiency of the use of heat than are steam engines. Tables published in *Marine Engineering* show that 81 per cent of the heat of the coal is transmitted to the steam engine, while engine losses make up 69 per cent. Thus the best actually available for mechanical work is 12 per cent of the weight of the coal. From the same coal 86 per cent of the energy is present in the producer gas; the losses in the use of this in gas engines total 66.5 per cent. That is, 19.5 per cent of the energy of the coal is available for mechanical work. A coal with 14,000 B.t.u. per pound furnishes mechanical work equivalent to 1,680 B.t.u. through the steam engine or 2,730 B.t.u. through the gas engine. Ten tons of coal converted to producer gas and used in the gas engine will do the work of sixteen tons when used in the boiler and steam engines. The producer gas process may be applied to all sorts of coals, and indeed, with slight modification, to a number of industrial wastes. Almost any material which is combustible may be converted to producer gas. The process is therefore one of using any kind of coal in the form of gaseous fuel.

Discusses Coal Gas

Coal gas has been made for about a century. The coal is roasted in retorts heated by outside fires; in this way the flame-producing gases are driven off and coke is left. When gas is the desired product, the coal is heated for a few hours in thin layers and at rather high temperature. The heat value of such gas is about two-thirds of that of natural gas. A soft coke remains in the retort and some tar and ammonia are recovered from the gases. By roasting the coal in thicker layers for longer time at lower temperature a leaner gas is obtained. The coke, however, is much stronger, denser and cleaner than in the former process. This by-product coke is the best fuel for metallurgical processes, the most important of which is the blast furnace. A portion of the gas is usually used for heating the coking ovens. The yield of coke is somewhat higher than that obtained in the old beehive process, where all by-products are lost. A ton of coal in the by-product process yields a surplus of 2.5 M gas, 10 gal. tar, and ammonia equivalent to 6 lb. of ammonium sulphate. These by-products have a value of $1.50 to $2. Ten tons of coal produce six tons of coke in the beehive process, while the same quantity in the by-product process yields seven tons and by-products worth at least $15. Testimony before Congress within the past year has shown that the complete conversion of the coking processes to the by-product process would be equivalent to the establishment of a new industry which at little additional cost would bring returns equal to a new and successful industry, with a billion dollars capital.

The Appalachian oil and gas fields have been producing for about sixty years and in many parts of the fields the production is now very small. Because the actual production is usually at some distance from large centers of industry and population it becomes necessary to store and transport oil and natural gas after they are produced. It is easy to store oils. Because of its bulk it is virtually impossible to store any large quantity of gas. One pound of oil has heating value equal to 18 cu. ft. of gas, or 1 cu. ft. (8 gal.) of oil is equal to nearly 1,000 cu. ft. of gas. Measured bulk for bulk, oil is about one thousand times as valuable as gas for fuel. These features caused gas to be considered a nuisance in the early development of the fields and led to the waste or very inefficient use of the gas. Under present conditions, however, the gas supply has decreased to such an extent that we must consider the efficient use of what remains and must look about for means of lengthening the supply. The Appalachian field is near large centers of population which will bid for its gas for use as a household fuel. The same features which make gas a valuable industrial fuel make it a very convenient household fuel. The householder can afford to pay a much larger price for this convenience than industry can. The extreme convenience of gas as a household fuel is sure to raise the price to such an extent that the industries must turn to other fuels. Household heating devices used with natural gas are for the most part quite inefficient. As the production of gas continues to decline, these household devices must be made more efficient. This increase of efficiency is achieved by changing the mixing devices and by bringing the burners nearer to the surfaces to be heated. The older heating burners for natural gas yield less actual heating than the burners for coal gas; that is, the older heating devices waste about one-half of the heat value of the natural gas used. The householder who is paying 45 cents per thousand for natural gas is buying two times the heat value that the householder buys when he pays one dollar per thousand for coal gas. The user of natural gas wastes half his heat or is actually paying about the same price for heat as the buyer of coal gas. In other words, by replacing his burners with efficient ones the user of natural gas may use one-half the quantity of gas and may thus enjoy the convenience of gas fuel for a much longer time than otherwise would be possible. The other possibilities in the lengthening of the time gas fuel will be available is to add to the gas from other sources. Happily, Pennsylvania is the largest producer of coal and coke in the country and in its coke industry has a source of gas of extremely large

importance and one which can be used as a means of lengthening the decreasing supply of natural gas to make it adequate for household use for many years. Even if mixed in equal quantities with natural gas, the mixture is still richer than coal gas and yields heat higher than is at present being used in most installations.

The future use of fuels is sure to change in the following directions: Coals will be converted to producer gas for industrial use in gas engines. Coal will be converted to coke in the by-product process instead of the beehive process. Coal will be used as a powder fuel, either alone or mixed with tar or colloidal fuel. Petroleum and its products will be restricted, by cost, to use only in special operations. The only gas of industrial importance will be producer gas. Natural gas and coke oven gas will be the available household fuel gas. It is probably unnecessary to state that use of natural gas which has not been free from gasoline will be out of the question. Gasoline vapor in gas is at present worth thirty to fifty times the same volume of gas.

The above statements are not intended to be predictions of actual conditions in any one industry or section, but are intended to indicate the directions in which we may expect the use of fuels to change.—*The Bessemer Monthly.*

Neighborly Gas Company Helps Movers

Peoples of Chicago Builds Good-will by Aiding Inexperienced

By H. D. KEMPERTON

They were going to move for the first time since their marriage.

"I suppose we'll have to get some men and have that table wrapped," said the husband. "We don't want that marred."

"Wait—I'll see what the gas company says about it," replied his wife.

"What's the gas company got to do with our moving?" asked the husband in amazement as his wife disappeared into another room.

"No, we won't have to bother about them if we get a reliable moving company," his wife informed him as she emerged from the kitchen bearing a booklet with the gas company's imprint on the back. "Here it says, under 'Moving Helps,' that 'All reliable moving concerns have blankets and rugs which are used on tables, chests, and other large pieces to protect the finish on them; so it is unnecessary to wrap them.'"

In response to his further inquiries she told him that this was a little booklet which the gas company had given her. When she had paid the last bill she had mentioned that they were going to move and what should they do about having the gas turned on in the new place. Not only was she directed to the proper window, after being told the advantage of leaving the order early, but she was informed that she might find some hints in this little book.

So the husband, interested, took the booklet, "When It's Your Move," put out by the Peoples Gas Light & Coke Company, of Chicago. In just skimming through it he found many inviting subheadings. They were inviting because they suggested to the family that is moving how labor, time, money, precious possessions—and disputes—might be saved Some of them were:

"Obtaining a Van."
"Packing."
"China and Glassware."
"Tables, Chests, Etc."
"Breakage."
"Estimates."
"Information to Get from Moving Company if Inexperienced."
"Moving Rates in Chicago."
"Pianos."
"Computing Distances."

These paragraphs were concise but chock-full of real information. They advised him to put in an order with a reliable moving company as early as possible, to ask whether the company held itself responsible for breakage, to have a representative come and estimate the cost of the job. They told him how to wrap dishes in newspaper or cloth and stand them on edge in barrels or boxes which had been padded with excelsior or shredded paper.

Then they told him the rates per hour and mile as fixed by city ordinance, what it cost to have the furniture moved to higher floors, and the separate charges for pianos and also player pianos. The street number system of the city was explained so that distances could be computed and even the possibility of using diagonally running streets in the route was suggested.

The things that the gas company needed to know were explained—the old address, the new address, date the gas was to be turned on and where the key to the flat could be found. Care is taken to explain that entrance to the basement is not enough—the precautions against any jets in the house being opened are emphasized. And, of course, the telephone numbers and addresses of the different neighborhood stores are given.

But best of all is the story that fills—with ten attractive illustrations—the first ten pages of the booklet.

You see a picture of a business man wiping his glasses, his stenographer halted in dictation. The wall calendar shows April 15 (note that it is half a month before a regular moving time) and the clock is five minutes to twelve. The story begins:

"Aw, shucks!" said the credit man, wiping his glasses. "I've got to move and I suppose I will have a dickens of a time getting my gas turned on at the new place and off at the old, just when I want it. It's an awful nuisance to be without gas, even for half a day."

"It is that," said the stenographer, "but I guess you won't have any trouble if you give the gas com-

pany half a chance; they have a really wonderful system of taking care of movers."

"Since when have you been holding a brief for the gas company?" he asks her and adds that so many people move in the spring and fall that any system would be busted.

She tells him, "Not the gas company's, if you are halfway reasonable," and adds some of the things he should do.

"Well, you seem to know a lot about it," said the credit man. "Where did you get your dope from?"

The stenographer explains that her chum "works over there, where they attend to the gas turn-ons." She quotes her chum as saying that it is some job to attend to the "quarter of all the people in Chicago" who change apartments every May and October.

Of course, this is interesting to the credit man, but what he wants to know is how it is going to help him get his gas turned on. That is easy, the stenographer tells him as she gets ready to go out to lunch (remember that clock was at almost noon). Her friend is coming over to go out to lunch with her.

"She is a regular perambulating encyclopedia on all matters relating to the gas company. Better hand her your questionnaire," she adds. "Here she is."

Enter Miss Dorothy Farley, who is formally introduced to Mr. Wellington, the credit man. Although Miss Farley had expressed herself immediately as being in a hurry because she wanted to do a bit of noon-hour shopping she is politely interested when the stenographer says she has a matter of business for her.

Use the Telephone

The credit man explains that he was just saying that he would have to visit her office. Miss Farley asks him why he doesn't telephone the order.

"I am afraid they would not get it straight; besides, don't I have to sign something?" he replies.

She tells him he need not bother about signing anything; he can sign the order when the man turns on his gas.

"And I am sure you need not bother about us not getting it straight over the telephone. You see, 58 per cent of all cut-off and turn-on orders are taken over the phone. About 170,000 in the course of a year," and she adds that the clerks are naturally expert at it.

Then follows conversation about how long notice should be given. The hitherto unnoticed ledger clerk wants to know "Why fifteen days?" Miss Farley explains how it helps to plan to add the proper number of inspectors during the rush. The credit man sees the logic but adds that with high rents there will not be many moves. He is told that the same rumor came up last year but that in 1921 the company had 295,208 turn-on orders and looks for as many this year.

"Our records show that about 2 per cent of the people in Chicago move at least once a year," Miss Farley adds. All these statistics move the stenographer to pipe up:

"I told you she was an encyclopedia."

Miss Farley offers to take the credit man's order but he decides to telephone. She welcomes this. As the booklet explains, "For three years she had wished she could see a customer at the other end of the line talking to one of the girls in the office. Here at last was the opportunity. Forgetting all about her lunch and shopping, she sat down and listened attentively to every word, watched every expression of the man's features. As he replaced the receiver she glanced at her wrist watch; it had taken exactly two minutes to give the order."

In the remarks that follow concerning getting the matter off his mind Miss Farley pictures the rush—6,000 incoming telephone calls on the last day of April, overtaxing the fifty-two available phones, drawing on other help and phones, and adds, "Hurry is twin to worry—both mean a waste of energy."

"You're quite a philosopher," ventured the ledger clerk, with a furtive glance of admiration.

Helping the Customer

Then the credit man comments upon the diplomacy of the order taker. "Almost at the beginning she courteously interrupted me; then picking up the loose threads of our conversation, she wove them into a fabric of sensible and essential questions. One appreciates how easy it is made for the customer to give an order, so cleverly is the leading done."

This brings out the reason—saving time for the customer. The selection of girls who are temperamentally fit, the school of instruction, the precautions to get the right number and many other things are explained—all informing and calculated to promote a better understanding between the patrons and the company.

"That girl knows what she is talking about," said the credit man (the end of the story is near). "People who move in April or September should co-operate with the gas company by giving them at least fifteen days' notice.

"She wasn't very hard on the eyes, either," added the ledger clerk, posting a debit entry on the credit side.

Such advertising as this goes a long way toward lifting a gas company from the "soulless corporation" class. It is human interest stuff through and through. Few families who are moving will fail to appreciate the helpfulness in the hints about packing and rates and the like.

How easy it would be to say that fifteen days' notice is necessary and let it go at that. Instead of such abruptness here is an attractive little book that virtually says in a neighborly manner:

"Well, well! So you're thinking about moving. Quite a job for you, ain't it? Maybe you'd save a little time if"—and so on. "And, by the way, we're going to be pretty busy ourselves about that time. Do you suppose you could help us out? You see, it's this way."

After they understood the gas company's side, who could refuse?

Not all gas companies may have the same volume of business as the Chicago companies. Their troubles may not be exactly the same. But whatever it is that the public ought to know can be impressed upon it. Offer in advance some information that will save the patron time, money or trouble. Or tell it through an honest-to-goodness story with honest-to-goodness people in it.

A sure-fire method, as in the case of the Chicago company, is to use both methods.

Editor Says Farmer and Utilities Suffer Same Ills

Farmers and public utilities are suffering from the same financial ills because neither can fix its own price on the commodities or service it has to sell, says the *Wisconsin Agricultor* in an editorial, part of which follows:

"If the farmer thinks his is the only business which is suffering because he is unable to fix the price at which he sells his services or his products, it will interest him to know that public utilities are finding themselves in precarious positions on account of the same condition. Take for instance telephone companies. Just like the farmer, telephone companies have large investments, but in order to realize a fair return upon their investments, they are compelled to go to the public. They cannot increase their prices without official sanction. Like the farmer when he finds out that it costs him more to raise cattle or any of his products, he cannot raise prices at will unless some other force is willing to pay the increase to which he is so justly entitled.

"If it is unfair for agitators, paid or otherwise, to constantly misrepresent the earnings of farmers, is it not as equally unfair to constantly attack public utilities? Farmers as well as public utilities render a distinct service to the public, and it would seem to the thinking man that both are entitled to a fair return on their investments. When the farmer is compelled to retrench he naturally reduces the number of the hired men. If a public utility is compelled to retrench, it likewise is forced to reduce the number of its employees. In both cases the result is unemployment, which could easily be avoided by the general public."

Explaining the Gas Plant's Wonders

By H. D. Kemperton

In order to give consumers a graphic idea of what a wonderful thing the seemingly commonplace gas plant is, the Gas & Electric Company, of Baltimore, Md., recently ran a striking page advertisement in one of the Sunday papers.

Half of the page was devoted to a drawing of the big Spring Gardens gas works. It was not a photograph but was carefully drawn by a competent artist in pen and ink so that every detail of the many big structures was emphasized. Excellent copy was run:

You Strike a Match and your gas range is ready for instant use.

Back of the Burner is one of the greatest and most modern gas plants in America. The plant covers fifty-seven acres, on which sixty-one structures have been built. At its wharves vessels of deep draft dock to discharge millions of gallons of oil. Railroads bring thousands of tons of coal to the piers whence it is brought by vessels to the works. The plant has a capacity of 45,000,000 cu. ft. of gas a day. Last winter it was called upon to deliver as much as 3,000,000 cu. ft. in an hour. The gas storage holders are the largest structures in Baltimore. A new one, costing a million dollars, has recently been put in service in anticipation of your needs. This one holder has a capacity of 10,000,000 cu. ft. The millions of dollars which have been invested are dedicated to

GOOD PUBLIC SERVICE

Is your service good? If not, let us know.

Not only does such advertising as this impress upon the public that all the gas company's receipts are profit, but it convinces the reader that the use of gas for heating and industrial purposes is growing.

Can Convert Peat into Steam and Gas

The United States Geological Survey, the Bureau of Mines and the Bureau of Standards are watching the development of a process, by persons not connected with the Government service, to convert the moisture and combustible contents of peat into steam and gas.

Reports have been made to the three Government bureaus that engineers appear to have discovered (1) that peat at a high water content can be burned indefinitely as a fuel and used for all the power processes of a manufacturing plant; (2) that water in the peat is an asset and not a liability; (3) that 30 cents' worth of peat will produce as much power as a ton of bituminous coal; (4) that the process would recover a large percentage of by-products, including coke, ammonia, light and heavy oils, and tar for dye base; (5) that other carbonaceous fuels might be employed the same as peat.

The Government experts in the three bureaus say that if the process that is being developed turns out successfully the effect will be to turn to commercial uses the immense peat beds found in some twenty States. The largest beds are in Minnesota, Wisconsin, the Dakotas, Michigan and Indiana. The lake beds in northern Indiana, according to the geological survey, are nearly all composed of peat.

It is estimated by the Bureau of Mines that the peat available in the United States is approximately 12,000,000,000 tons. It is estimated that about half of this amount is in Minnesota. And it also has been estimated that there are between two and three billion tons of peat available in Wisconsin.

The total swamp area of the United States, exclusive of Alaska, is estimated to be 139,855 square miles. The geological survey estimates that 8 per cent of this area has peat beds of good quality. The depth of peat over this vast area is assumed to average at least 9 ft., giving 200 of dry fuel an acre for each foot of depth.

The geological survey has for many years been calling attention to the enormous supply of peat—a supply that thus far has remained practically untouched—and has asserted that this enormous fuel supply would be utilized as a substitute for coal and fuel oil.

From time to time, it is said, the survey has asked Congress for money to experiment with the use of wet peat as well as dry peat, but the legislative body has not granted these requests. The manufacture of peat bricks by private interests has been successfully carried on, and these bricks, experience has shown, constitute a desirable fuel.

Public Utilities Securities Market Report

Prices of Representative Gas Bonds

(Quotations furnished by The National City Company)

Company	Issue	Maturity	July 27, 1922 Bid	Asked
American Lt. & Trac. Co.	Five Year 6s	May 1, 1925	106	107
Brooklyn Union Gas Co.	First Consol. 5s	May 1, 1945	95½	96
Columbia Gas & Elec. Co.	First 5s	May 1, 1927	96⅛	97
Consol. Gas, Elec. Lt. & Pr. Co. of Baltimore	First Ref. 7½s	Dec. 1, 1945	108	109
Consol. Gas, Elec. Lt. & Pr. Co.	General 4½s	Feb. 14, 1935	88½	90
Consol. Gas Co. of New York	Sec. Conv. 7s	Feb. 1, 1925	119½	120
New Amsterdam Gas Co.	First Consol. 5s	Jan. 1, 1948	82	84
Denver Gas & Elec. Co.	Gen. (now 1st) 5s	May 1, 1949	92½	93½
Detroit City Gas Co.	Gold 5s	Jan. 1, 1923	99¾	100¼
Equitable Illum. Gas Lt. Co. of Philadelphia	First 5s	Jan. 1, 1928	100½	102
Hudson County Gas Co.	First 5s	Nov. 1, 1949	89	—
Laclede Gas Light Co.	Ref. & Ext. 5s	Apr. 1, 1934	91	91¼
Louisville Gas & Elec. Co.	First & Ref. 7s	June 1, 1923	100	101
Michigan Light Co.	First & Ref. 5s	Mar. 1, 1946	88	89½
Milwaukee Gas Light Co.	First 4s	May 1, 1927	92½	93
Pacific Gas & Elec. Co.	Gen. & Ref. 5s	Jan. 1, 1942	90¾	91½
Pacific Gas & Elec. Co.	First & Ref. 7s	Dec. 1, 1940	105½	107
Cal. Gas & Elec. Corp.	Unif. & Ref. 5s	Nov. 1, 1937	96½	97
Peoples' Gas Lt. & Coke Co.	Refunding 5s	Sept. 1, 1947	90	90¾
Chicago Gas Lt. & Coke Co.	First 5s	July 1, 1937	95	97
Portland Gas & Coke Co.	First & Ref. 5s	Jan. 1, 1940	89	90
Seattle Lighting Co.	Refunding 5s	Oct. 1, 1949	82	83½
Southern California Gas Co.	First 6s	Nov. 1, 1950	96	98
Utica Gas & Electric Co.	Ref. & Ext. 5s	July 1, 1957	90¾	—
Washington Gas Light Co.	General 5s	Nov. 1, 1960	93¼	94
Western States Gas & Elec. Co. of California	First & Ref. 5s	June 1, 1941	89½	—

Kansas City (Mo.) Gas Co. to Weather the Storm

The railroad shopmen may strike and be "dern to 'em," so far as the Kansas City Gas Company is concerned, the company can assure the public that precautions have been taken against just such contingencies as the present unpleasantness. With a program that includes the laying of twenty-five miles of new mains, half of which have been laid, the company still has plenty of both cast iron and galvanized pipe on hands to finish its program.

In March 150,000 ft. of 1¼ in. galvanized was added to the company's stock, and in May 125,000 ft. of cast-iron pipe of various sizes. This pipe was bought with the view in mind of catching up on deferred construction; the twenty-five miles of new mains will be completed by the end of this season.

Mixed Coal and Coke Fuel for Water Gas Manufacture

Results obtained by W. J. Dunkley, gas engineer of the Bureau of Mines, in the course of experiments made at Ottawa, Ill., in the use of mixed coal and coke fuel for water-gas manufacture show that capacities up to 97 per cent of the rated capacity with good coke fuel can be obtained, using 70 per cent Illinois coal and 30 per cent coke from Kentucky coal, with 6-ft. gas sets operating up to ten hours per day. The generator fuel consumption was about 33.5 pounds of mixed fuel per 1,000 cu. ft. of gas made.

Columbia G. & E. Earnings

Columbia Gas & Electric June gross earnings were $1,299,154, increase of $239,636 over the same period, 1921. Net earnings available for fixed charges were $808,213, increase of $124,398, and surplus after charges $332,501, increase of $74,805. For six months ended June 30 last gross amounted to $9,485,184, an increase of $1,620,556 over six months of 1921. Net available for fixed charges was $5,843,963, increase of $567,942, while surplus after charges and available for dividends amounted to $3,023,013, increase of $328,175.

Water Gas Apparatus Being Remodeled

The Iowa City (Iowa) Light & Power Company is remodeling its carbureted water gas apparatus and to that end has awarded a contract to the U. G. I. Contracting Company, of Philadelphia.

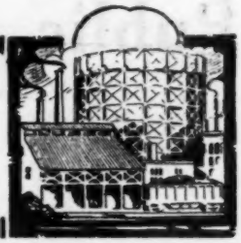
Specific Gravity of Coke

Experimental work is being conducted at the Pittsburgh, Pa., experiment station of the Bureau of Mines on the influence of fineness, medium, and time of boiling, in determining the true specific gravity of coke, which determination is used in calculating the amount of cell space or porosity of metallurgical coke.

Carbonized Lignite Fuel

Experiments on the treatment of lignite, raw and carbonized, by the Trent process are being made in North Dakota by W. W. Odell, fuel engineer of the United States Bureau of Mines. Construction of a vertical lignite carbonizing oven has been completed.

NEWS OF THE GAS INDUSTRY



Charleston, S. C., to Have New High-Pressure Main

The Charleston (S. C.) Consolidated Railway & Lighting Company is installing a sixteen-inch high-pressure pumping main in the city of Charleston, and has awarded to the U. G. I. Contracting Company, of Philadelphia, a contract for making the installation.

Des Moines to Have New Holder

Des Moines (Ia.) Gas Company will shortly erect a 2,500,000 cu. ft. capacity storage holder. The contract for installing the foundations and supervising the erection of the holder has been awarded to the U. G. I. Contracting Company, of Philadelphia.

Chester County Company Is Installing Steel Purifier

The Chester County Gas Company, of West Chester, Pa., has contracted with the U. G. I. Contracting Company, of Philadelphia, for the installing of a ten by sixteen by nine and a half foot steel purifier complete with connections.

Remodeling Norfolk Plant

The U. G. I. Contracting Company has been awarded a contract by the Connecticut Light & Power Company for a comprehensive remodeling of its Norwalk, Conn., plant.

In general, the work will include the remodeling of two six-foot sets by the inclusion of modern features, tending to increased capacity.

There will also be installed a motor-driven blower plant, additional condensing apparatus with connections, new steam pipe system and other miscellaneous apparatus. The contract includes all work complete, including foundations.

Enlarging Generating Capacity

The Union Heat, Light & Power Company, of Winchester, Ind., is enlarging the generating capacity of its water-gas plant and has placed contract with the Gas Machinery Company, of Cleveland, Ohio, for a 6-ft. double superheater carbureted water-gas apparatus complete with generator, reverse steam connections, carbureter, superheater and stack, seal separator, steam and air meters, gauge board and piping, blast equipment and auxiliary apparatus.

The new 6-ft. water-gas set will go into the gas company's present building alongside of the present 5 ft. 6 in. water-gas set and will be provided with special equipment for using bituminous coal in the generator.

Atomized Fuel Company Progressing

At a cost said to be $150,000 the Colorado Atomized Fuel Company hopes to start by September its new plant. Other plants will be established in Colorado Springs and Pueblo.

To explain what atomized fuel is, a simple explanation will be best. The waste or fines are taken from the mines, dried and crushed to dust. This dust is kept in airtight bins until wanted for fuel purposes; then it is mixed with air, floated into the fire-box, where perfect combustion is obtained. It is another case of finding great value in things we believed were useless.

Gas Company Holds a Picnic

The whole force of the Denver Gas & Electric Light Company closed up the office and as much of the shop as was permissible on Saturday, July 22, and went to a picnic over in beautiful Deer Creek Park. It was some day and a very enjoyable time was had.

Monroe Offered Channel for Development

That the natural gas resources of Monroe, La., are not being utilized fully to their best advantage cannot be doubted. Every now and then one hears of a new company making advances for piping the gas to other localities but save for a conference or two nothing more is heard of the project.

Monroe has the power to supply gas to larger centers of population. That much is certain. If any doubt exists in anyone's mind of that fact, all he need do is to refer to the certified reports of the Department of Conservation or the statistics of the carbon-black industry in Louisiana to be convinced that his doubts are groundless.

But what is being done? Nothing so far as we can ascertain. True enough, there are periodic flurries whenever the news spreads that another company is forming plans to construct a pipe line to neighboring cities for industrial and domestic purposes but these flurries subside without beneficial developments.

Only last month the Ouachita Natural Gas & Oil Company, at a meeting of representatives of the gas interests of northeastern Louisiana and business men of the Monroe industrial field, in the Chamber of Commerce headquarters, submitted an offer, subject to ratification by the board of directors of the company, for the construction of a five-mile industrial pipe line to territory south of Monroe, where it is proposed to establish an industrial center. Here was a chance—not a monstrous one, perhaps, but a chance—to utilize some of the gas stored in the earth to the best advantage. Let us see what happened:

The offer was submitted by Samuel D. Hutner, Jr., representing the Ouachita Natural Gas & Oil Company. Mr. Hunter announced that the company would be willing to extend its present line, or build an additional line, from Monroe south of the city under the present schedule

of rates—which range from 5 to 10 cents per thousand cubic feet on a sliding scale. It was explained that the industrial pipe line would take care of new industries that would, in consequence, be established south of the corporate limits of Monroe along the Ouachita River and the Missouri Pacific Railway.

The Ouachita Natural Gas & Oil Company offered to furnish sufficient gas to operate twenty-five factories, if necessary. The company is in a position to do this, as it and allied interests have thirty-six producing wells with a total capacity of 250,000,000 cu. ft. daily at its command. In the event that any factories should be established beyond the five-mile limit, Mr. Hunter said that the cost of the line would have to be borne by the factory or factories that proposed to build there or be borne by the interests that were seeking to extend the industrial center. The gas company, however, would offer the same scale of rates for any plants which might be established beyond the five-mile limit.

Not a half-bad offer. Did the members of the conference snap it up? They did not! The result was, the conference took no action whatever in the matter save to promise that this and other offers submitted by various other gas companies would be given thorough consideration after the annual meeting of the Monroe Chamber of Commerce in the latter part of June. Furthermore, action on the establishment of an industrial board was deferred because of the fact that new officers would be elected within a few weeks.

A ray of hope was seen in the assurance that plans would go forward at once, under the direction of the Chamber of Commerce officials, to secure factory sites on the Ouachita River and the Missouri Pacific Railway for a distance of five miles south of the corporate limits of Monroe. Some of these sites, it is said, have already been pledged and it is further announced that it will be possible to secure a number of sites free along the river and adjacent to the proposed pipe line.

The trouble is that the June meeting of the Monroe Chamber of Commerce is over and the new officers have been elected—but no further action on the offer has been taken. At least, to the knowledge of the writer, no action has been officially announced. Perhaps the Chamber of Commerce has acted but if they have done so the whole thing has been done rather quietly.

At the conference in question, a number of other offers were made either in person by representatives of other gas interests or by letter. Each of these offers, irrespective of its origin, was in favor of closer cooperation and aid in supplying industries with gas. The Southern Carbon Company, in a letter from J. D. Pribble, general superintendent, stated that the company has an eight-inch line to Monroe and would be willing to assist in the movement. The LaDel Oil Properties, Inc., through L. M. Calhoun, president, and L. W. Burrows, representing Henry C. Morris, trustee, expressed their willingness to sell gas to industries, giving all the aid possible to build up Monroe industrially.

It is evident that what Monroe needs is more action and less promises. The full benefit from the gas fields will never be realized until every possible channel for distribution of the gas is used. It is not sufficient to hold a conference and then, after having heard offers made, agree to place them before another body for "thorough consideration." If Monroe is to develop her wonderful opportunity she must learn to recognize the potential power of action.

Engineers to Meet

The engineers in the iron and steel industry will meet in convention during the week of Sept. 11 to 15, 1922, at Cleveland Public Hall, Cleveland, Ohio, at which time there will be presented and discussed subjects dealing particularly with steel mill problems.

The papers have been written with a view of giving to the engineers as much practical data as is possible, feeling that this class of information is far more beneficial than the theoretical side when dealing with steel mill problems.

Some of those who will present and discuss the subjects are Dr. C. P. Steinmetz, B. G. Lamme, Wilfred Sykes, A. G. Witting, F. C. Watson, D. M. Petty, L. W. Heller, R. B. Gerhardt, D. B. Rushmore, J. B. Crane, E. R. Fish, R. M. Rush, R. F. Butler, F. Hodson, Prof. Edgar Kidwell, F. W. Cramer, A. R. Leavitt, E. T. Moore, R. H. Bauer, F. A. Wiley, L. F. Galbraith, R. S. Shoemaker.

A tentative list of the subjects to be presented are: "Improvement in Efficiency of Electric Power Supply"; "A Review of Steel Mill Electrification"; "Boiler Practices of 1922"; "Education and Safety"; "The Gas Engine as a Prime Mover for Power Generation"; "Steam Turbines"; "Judging Combustion from Gas Analysis"; "Electrification of the International Nickel Company's Works for Monel Metal"; "Some Considerations in the Electrification of the Steel Plant Railroad Yard"; "Power in the Iron and Steel Industry"; "Control — Motor — Lighting and Crane Standardization"; "Electric Furnaces"; "Electrical Developments in 1922"; "Investigation of Insulators for Steel Mill Service."

In addition to the technical sessions, there will be an unusually attractive exhibition of apparatus of particular interest to the steel mill engineers.

This exhibit will cover approximately 30,000 sq. ft. of floor space and will be held in the same hall as is the technical sessions.

Representatives from practically every steel mill in the United States are expected at this convention for it will interest practically every class of engineer, such as general managers, general superintendents, mechanical engineers, master mechanics, superintendents of power, engineers of tests, safety engineers and department foremen.

News from Texas Oil Fields

It may be hot where you are, but you "orter be in Texas" if you want to feel, see and smell the heat, but such a little thing as heat does not prevent the Lone Star boys from spouting oil.

In the Bunger field, vicinity of Graham, the Foster well came in with 3,000 bbl.

With Jim Haynes and Jack Dalton interests setting the pace in Palo Pinto County, many others are trying to "repeat past performances." If they do it will be worth recording.

Cross Plains, Texas, expects to get a large refinery, using the Ford method of extracting gasoline from crude, a system which promises 5 per cent more gasoline than others are able to obtain. No, it isn't Henry; it is J. D. Ford.

Surety Sued by Gas Company

Louisville, Ky.—Suit for the recovery of two sums aggregating $26,717.64 have been filed in Circuit Court by the Louisville Gas & Electric Company against its former surety, the National Surety Company. The plaintiff alleges that in one instance there is due it $2,869.79, and in another $23,847.85.

The suit recalls the actions brought by the city against the Gas & Electric Company on Feb. 7, 1918, for a total of $300,000 on two bonds which the company had given the city, with the National Surety Company as surety, for the faithful performance of its contract under the measure known as the "gas franchise ordinance," which was approved March 29, 1913. In the first of these suits, the city was given judgment for $50,000, and in the other, the judgment for the city was $250,000. The Louisville Gas & Electric Company, it is stated in yesterday's suit, appealed from the findings on July 5, 1919, this appeal being taken to prevent enforcement of the judgment against it or its surety until determination by the Court of Appeals. The Gas & Electric Company alleges that the National Surety Company failed to join in the appeal or in the execution of the supersedeas bond until the Gas & Electric company deposited with it, in the $50,000 suit, $58,000 to indemnify it against loss, and in the $250,000, the sum of $292,000 for like purpose. Both these amounts were deposited and the bond was executed. The claim of the Gas & Electric Company is that, although the Court of Appeals reversed the findings of the lower court in both cases, and that the mandates were received in due time, the National Surety Company has failed to repay to the gas company the sum of $2,869.79 in the $50,000 suit and the sum of $23,847.85 in the $250,000 suit. The principal in both instances has been returned to it, plaintiff says.

Seek Rate Rehearing

St. Joseph, Mo.—A motion for a rehearing in the gas rate case will be filed in the Supreme Court shortly, said W. E. Stringfellow, attorney for the St. Joseph Gas Company, recently. Mr. Stringfellow had just received a copy of the opinion by which the Supreme Court knocked out the rate established by the Public Service Commission, in effect from Nov. 5, 1920, to Jan. 24, 1922.

Mr. Stringfellow said the gas company would have no statement to give out until the Supreme Court had passed upon the motion to reconsider. If the motion is granted, the case will be argued again. If it is denied, the case will be ended. Until final action is taken by the Supreme Court nothing will be done in the way of refunding excess charges, it is announced.

Under the opinion of the Supreme Court the rates of the company of $1.60 a thousand cubic feet and a service charge of 50 cents to $1.25 a month are declared excessive. The rate before that was $1.30, and would be the maximum under the decision.

The opinion of the Supreme Court is said to be the first in which it has failed to uphold the service commission in rate fixing.

Gas Rate Is Pared by State

Lansing, Mich. — Public utilities not rendering service commensurate with the return they are receiving on their property can look for no support from the Michigan Public Utilities Commission, it became known recently.

In an order the commission cut the rates of the Allegan County Gas Company by 25 cents a thousand because of the poor quality of gas being furnished consumers. This cut will allow the gas company to make no more than enough to pay taxes, interest and other fixed obligations. There will be nothing left over for a return of the investment.

The commission recently received many complaints from Allegan County gas consumers regarding the poor quality of gas being furnished. One of the commission's testers was sent to Allegan County and he reported that the gas measured only 425 heat units per foot. The minimum number of units prescribed by the commission is 530 per foot.

Plan Co-operative Advertising

Ann Arbor, Mich. — Michigan public utilities have been invited to align their advertising managers with a national advertising association for developing standards of ad copy, and ideas for telling the public utility story, which is now being organized.

The movement, which is only just under way, was recently inaugurated at Milwaukee. It is planned to form the Public Utility Advertising Association and to make it a unit of the Associated Advertising Clubs of the World. A code of standards has been suggested which contains the following points to be observed in the preparation of ad copy:

First consideration must be given to the public interest: no erroneous or ambiguous or misleading claims shall be made; every consistent effort is to be put forth to sustain public confidence in statements contained in advertising copy; no unfair demands must be made upon those who sell advertising copy; co-operation must be extended to publishers in the interest of keeping their columns free from erroneous and false matter.

These standards have been laid down by public utility advertisers identified with several companies whose experience in advertising their business has been widespread.

Gas Company Valuation Is Made by Authorities

Grand Rapids, Mich.—City Manager Fred H. Locke, Director of Public Service Gerald J. Wagner and City Attorney Ganson Taggert have voiced their approval of the appraisal of the Grand Rapids Gas Light Company made by the engineers of the public utilities commission, who appraised the property of $3,573,469.90.

Wagner said that the valuation fixed by the State is practically the same as fixed by the city. The city's appraisal fixed the value at $4,175,387, but this included material and supplies, while the State's appraisal does not. When the working capital of $356,000 is added, the figures will be approximately the same as the city's.

Gas Company Petitions for Issue of Bonds

Indianapolis, Ind.—Authority to issue $16,000 worth of bonds to reimburse its treasury for betterments and improvements made to its property was asked recently of the Public Service Commission by the Central Indiana Gas Company.

The petition states that the company spent $21,340.69 on these improvements at its different places and that the money is now necessary to provide a working capital.

Michigan Gas Association Convention

The Michigan Gas Association, according to an announcement just sent out, will hold its annual convention on steamer, on the Great Lakes, Sept. 14, 15, 16. The following letter has been sent to each member:

"The boat trip proposition has carried by a big majority. At the present writing there are dark clouds on the business horizon and it is possible that on Sept. 13 to 16 we will be busy mining coal or running railroad trains. Nevertheless, those days are still two months off and the executive committee has decided to take a chance on the prospect that conditions will clear up and we are going ahead as if the boat trip is a sure thing. Quite likely after the strain of the crises through which we are passing we will all welcome a few days' vacation on the water. Therefore—

"The boat trip is on and we want every member from now on to work to make it the most successful trip of its kind and the most successful convention that our association has ever held. The tentative details are exactly as outlined in our letter of June 19. The steamer "Manitou," an exclusively passenger boat and one of the best on the Great Lakes, will leave Muskegon late on the evening of Wednesday, Sept. 13. She will cruise along the east shore of Lake Michigan, stopping at Charlevoix and Mackinac Island, and perhaps other points, and will again reach Muskegon on the early evening of Sept. 16—further details to be announced later.

"At the time the vote was taken a very large percentage of those voting for the boat trip pledged themselves for the purchase of one or more tickets. In fact, the number of pledges received was far above the number that we expected to get so early in the game. As these pledges are not cancellable they insure the success of the trip, because we will have no difficulty in getting enough additional to make up the minimum number of passengers required, and we feel sure that when this announcement reaches our membership there will be a large additional call for reservations.

"The purpose of this letter is to acquaint the membership with the result of the vote, and to request those who have not thus far signified their intention to make the trip to send in their requests for reservations at once. About Aug. 10 the tickets will be ready for distribution and members will be asked to send their remittance, and staterooms will be assigned in the order in which remittances are received. (You will remember that the letter of June 19 stated, 'The tickets will be sold and the money collected well in advance of the date set for the trip.') Should the trip be cancelled because of untoward business conditions the proper refunds will, of course, be made. The price as stated in our previous letter will be $35 per passenger, including transportation, meals and stateroom on the basis of two persons to each room. The outside staterooms will be assigned first and after these are gone the inside ones. There will be six or eight parlors available, the price of which will be announced later.

"A splendid business program is being provided for as well as some exceptionally interesting speakers. It will be a real convention as well as a pleasure trip."

Company Urges Safety First

Dallas, Texas.—Each customer of the Dallas Gas Company has received a card from the hands of a company representative to be placed in a conspicuous place in the home telling how to safeguard against accidents through allowing gas to escape in the rooms. The card is neat and easily read. It contains one paragraph giving some warnings as follows:

"To avoid danger upon observing the odor of gas immediately comply with the following:

"1. Do not search for leak with lighted candle or lighted match or flame of any sort.

"2. Open all doors and windows in the room where odor of gas is detected.

"3. Extinguish all flames.

"4. Close all gas valves and cocks.

"5. Shut off gas at meter.

"6. Notify gas company's office at once.

"No flame of any kind should be permitted on premises until escape of gas has been effectually stopped."

The card contains other information as to the safe use of gas, gives the rule as to the responsibility of the customer for escape of gas from customer's pipes and stresses the desire of the company to eliminate every element of danger wherever possible. The company keeps an inspector in its office every hour of the day and night whose duty it is to attend promptly to reports of escape of gas or gas leaks.

Northern Indiana Company Making Improvements

Fort Wayne, Ind.—Improvements aggregating $100,000 are now being made at the Fort Wayne plant of the Northern Indiana Gas & Electric Company. The work in part is now under way, although the plans involve for the next six months extensions of the company's mains, additional condensing apparatus and additions to plant and system.

The announcement to this effect was made by S. E. Mulholland, vice-president of the company, following the filing of a mortgage believed to be the largest ever presented for record in Allen County.

Covering a bond issue of $7,000,000 and involving property in fifteen counties in northern Indiana, the mortgage was presented on behalf of the company by W. A. Haase, of Hammond, Ind. It was executed by the gas company to the Fidelity Trust Company of Philadelphia. All the company's local property, including plant, distribution system and real estate, as well as its holdings elsewhere, is involved in the transaction. In addition to Fort Wayne, the plant extensions will affect Bluffton, Decatur, Wabash, Peru, Lafayette, Frankfort, Lebanon, Crawfordsville, South Bend, Mishawaka, Plymouth, Hammond, Michigan City and East Chicago.

Mr. Mulholland stated that the filing of the mortgage marks the consummation of the company's refinancing, which was before the Indiana Public Service Commission about two months ago.

The bonds which are secured by the mortgage are first lien and refunding bold bonds, 6 per cent series of May, 1922. It is believed that the money raised in this way will cover all the company's refinancing for the next two or three years.

New Wilmington Gas Rates Cut

Harrisburg, Pa.—The New Wilmington Gas Company, operating in Mercer and Lawrence counties, has filed notice of decreases in rates and some changes in regulations with the Public Service Commission.

Mississippi Exempts Public Utilities from Taxation

Lansing, Mich. — Interest and considerable discussion in official circles have been aroused by a bill passed by the Mississippi Legislature, which is just taking effect. It provides five years exemption from ad valorem taxation for all public utilities and many industries.

The measure was adopted as a means to stimulate industry and the State Government is giving it wide publicity over the country, hoping to place Mississippi in the forefront as an industrial community of the South.

The bill exempts the tangible property but not the products of the following types of enterprises from payment of ad valorem tax:

Common carrier, standard-guage railroads, textile mills and those which manufacture cloth and hemp products, industrial and agricultural machinery industries, clothing, shoe, furniture and other woodworking plants, building material establishments, paper products, dairying companies, canneries, leather tanning plants and all public utilities. The bill specifies as tax exempt all factories of whatever nature run exclusively by water power, all conduit and pipe lines, pumping plants, natural and manufactured gas appliances, manufacturing and distribution of equipment, hydro-electric plants and steam and oil-burning electric stations and ice factories.

Sponsors of the measure expect large industries to establish branch plants in Mississippi. By exempting water power driven plants they anticipate rapid development of this source of energy.

Faces Coal Famine

Beacon, N. Y.—Entirely unexpected by the Beacon coal dealers was an order from Commissioner of Public Safety John T. Cronin prohibiting the utilization of any egg, grate or lump coal, suitable for use in the generation of steam or gas, for use outside the boundaries of the city of Beacon.

This action was deemed necessary, as the present situation is dangerous to the health of the people.

A survey of the amount of coal in Beacon for local consumption revealed the fact that the Storms and the Beacon Lumber & Coal Company yards were practically without any of the kinds mentioned.

According to the ruling of the Commissioner of Public Works, the coal now at the Ainsworth yard cannot be removed by its owner, the Bell Isle Brick Company, because their yard is situated outside the city limits.

The order is the outcome of the severe shortage experienced by the Southern Dutchess Gas & Electric Company, which depends on egg, grate or lump coal of the specified kind to manufacture gas for lighting and cooking purposes in Beacon.

From various sources come reports of shortages in other cities. The supply at the Southern Dutchess Gas & Electrical Company is sufficient for about one month.

Coal has not been commandeered as yet. Strenuous efforts are being made by the company in securing a quantity in other places. The Public Service Commission was appealed to and it responded with the names of three dealers, all of whom, on being communicated with, stated they were not able to supply any.

Every pound available has been purchased by the company and it has redoubled its efforts in the past few days. If it is found that none can be obtained from outside sources, the local company will have to commandeer the coal within the city limits for the manufacture of gas.

The domestic situation is not so bad. The Long Dock Company received a boatload recently which contained 450 tons of chestnut coal. This will help in a great measure to relieve the anxiety of domestic users. The other yards also have a supply of stove coals on hand sufficient to care for the local situation.

State Can Bar Municipal Gas Plant

Detroit, Mich.—Whether Detroit will ever have municipal ownership of the plants now operated by the Detroit City Gas Company will have to be decided by the Michigan Legislature, which will be asked to allow the city to increase the limit on bonded indebtedness from 2 per cent of the assessed valuation to 4 per cent. It was learned recently that the city is now so deeply in debt that the law as it now stands would not permit it to issue the required bonds, to the amount of at least $30,000,000.

At present the city has a leeway of about $16,000,000 within the sum allowed by State law for public utilities. When the bonds now authorized but not issued are sold this leeway will be wiped out. There remain to be sold $5,950,000 worth of street railway bonds; $2,368,000 in public lighting bonds and $9,230,000 in water bonds. A million or more bonds expiring in the next year would bring the total to about $16,000,000, all of which have been authorized by the voters. This means that to buy the gas company's holdings the city's bonding limit for public utilities would have to be raised at least $30,000,000.

Mayor Couzens favors purchase of the gas company's property and Acting Mayor John C. Lodge declared that proposition probably will go before the electorate at the fall election. If the people vote to buy the system, the final decision would still rest with the legislature, for if that body refused to increase the bonding limit, the deal could not go through.

New Orleans to Get Reduced Rate

New Orleans, La. — Seven-cent carfare and $1.30 gas will be realities in New Orleans not later than Sept. 10, it was announced recently by Receiver J. D. O'Keefe of the New Orleans Railway & Light Company.

Mr. O'Keefe's announcement followed an order from the Federal court fixing Aug. 17 as the date of sale of the properties of the railway and light company, under foreclosure proceedings instituted by the 4½ per cent bondholders. The sale will be held in front of the civil district court building at noon, and the property is to be bid in by the reorganization committee.

"I am told by the attorneys that the passing of title from the receiver to the new company should take place some time between Sept. 1 and 10," said Mr. O'Keefe. "When the title is passed the new company will begin operation, and under the terms of the settlement with the city the 7-cent fare and reduced gas rate will go into effect at once."

All records for speed have been broken so far in the reorganization of the railways company, according to local financiers. The bondholders' committee has received many telegrams from Northern investors in the company congratulating it on the expedition and economy with which the affairs of the old company are being settled and the way cleared for the new utilities concern.